

Status of the Critically Endangered Yellow-crested Cockatoo *Cacatua sulphurea djampeana* in the Tanahjampea islands, Flores Sea, Indonesia

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Information about the presence and status of the Yellow-crested Cockatoo *Cacatua sulphurea djampeana* in the Tanahjampea islands has been lacking for 22 years. During our six-day visit in September 2015 we observed 14 cockatoos on Tanahjampea Island and three on Kalao Island. Although we assume that the two islands still hold the largest population of the species apart from Komodo and Sumba, a clearly recognisable decrease in forested areas and especially the loss of large potential nesting trees threatens the existence of this endemic cockatoo subspecies.

INTRODUCTION

Yellow-crested Cockatoo *Cacatua sulphurea* occurs in Sulawesi and the Lesser Sundas Islands, as well as extraliminally on Penida Island lying close to Bali, and Salembu Besar in the Java Sea (White & Bruce 1986, Coates & Bishop 1997). This species has suffered (and may still suffer from) an extremely rapid population decline owing to unsustainable trapping for the cage-bird trade. It is therefore classified as Critically Endangered (BirdLife International 2016).

Until recently, only four subspecies *sulphurea*, *abbotti*, *parvula* and *citrinocristata* were recognised (Forshaw 1989, Rowley 1997). However, recent analysis has resulted in the reinstatement of the subspecies *occidentalis*, occurring from Lombok to Alor and therefore leaving *parvula* confined to Timor, and *djampeana* restricted to the Tanahjampea Islands. A new subspecies *paulandrewi* has been described from the Tukangbesi Islands, in addition to the existing subspecies *sulphurea* from the Sulawesi mainland, *abbotti* on Masalembu Besar and *citrinocristata* on Sumba (Collar & Marsden 2014).

The Tanahjampea islands lie in the Flores Sea, the main islands being Kayuadi, Tanahjampea, Kalao, Bonerate, Karompa-lompa, Karompa, Kalaotoa and Madu. Tanahjampea (172 km²), the largest island, lies about 123 km from the north coast of Flores and 154 km south of the Sulawesi mainland.

There are the following Yellow-crested Cockatoo records from the Tanahjampea islands: Kayuadi (September 1927), Tanahjampea (December 1895), Kalao (July 1927), Kalaotoa (May 1927) and Madu (May 1927) (BirdLife International 2001). A two-day visit to Tanahjampea Island by Dutson on 23–24 September 1993 resulted in sightings of two Yellow-crested Cockatoos, but he did not find the species on Kalao, Bonerate, or Kalaotoa (Dutson 1995). Cockatoos were not observed during birdwatching tours to Tanahjampea Island in 2011, 2013 and 2014 (Eaton & Hutchinson 2011, Lambert 2013, Eaton & Nelson 2014).

METHODS

We visited Tanahjampea Island on 8–11 September 2015 from the beach area to the highest part of the island (520 m). We then visited Kalao Island (about 18 km south-east of Tanahjampea) on 12–13 September 2015, from the beach area to 150 m (the maximum altitude of Kalao is 320 m).

We began our searches for Yellow-crested Cockatoos by interviewing local people about their knowledge of, and experiences with, the species. Several locations were then visited: five on Tanahjampea and three on Kalao (Table 1). Each encounter with cockatoos (seen or heard) was recorded, noting the location using

Table 1. Cockatoo observation trail locations on Tanahjampea and Kalao, September 2015.

Date	Island	Location	Altitude (m)	Habitat
8–9	Tanahjampea	Bandai	50–165	forest-garden, rice field, scrub, secondary forest
8–9	Tanahjampea	Dodak dam	20–80	forest-garden, rice field, scrub, secondary forest
10	Tanahjampea	Buhun Sanrang	20–150	forest-garden, rice field, scrub, secondary forest
10	Tanahjampea	Telkom track	40–520	forest-garden, scrub, secondary forest
11	Tanahjampea	Marege dam	20–100	forest-garden, rice field, scrub, secondary forest
12	Kalao	Batu Maruru	10–150	forest-garden, scrub, secondary forest
13	Kalao	Tombang	10–225	forest-garden, scrub, secondary forest
13	Kalao	Toki	0–30	garden, scrub

GPS, altitude, type of habitat (forest, forest-garden and garden), number of birds and notes on their activities. The forest was entirely secondary but for our purposes did not include tree plantations; forest-gardens were areas where cultivations formed a mosaic within forest; and gardens were areas dominated by cultivation, including tree plantations. Observers attempted to ensure there was no double counting of the same individual by careful tracking of every cockatoo observed.

Encounter rate was calculated by dividing the total number of individuals (seen or heard) by the total length of the observation trail. Stretches of observation trail that passed through gardens (non-cockatoo habitat) were not included in the trail length. The trail in the field was plotted using GPS and the trail length calculated with Google Earth software.

Observations were carried out in the morning (07h00–11h00) and afternoon (15h00–18h00). Walking speed was 1–2 km per hour. Each trail was walked 1–3 times. If cockatoos were recorded on more than one visit to a trail, the number of individuals judged present was taken to be the largest number counted on any one visit. Most trails were walked by HB and TA together, but some were done by either HB or TA alone, depending on the location of the trail, time, and the availability of guides.

RESULTS

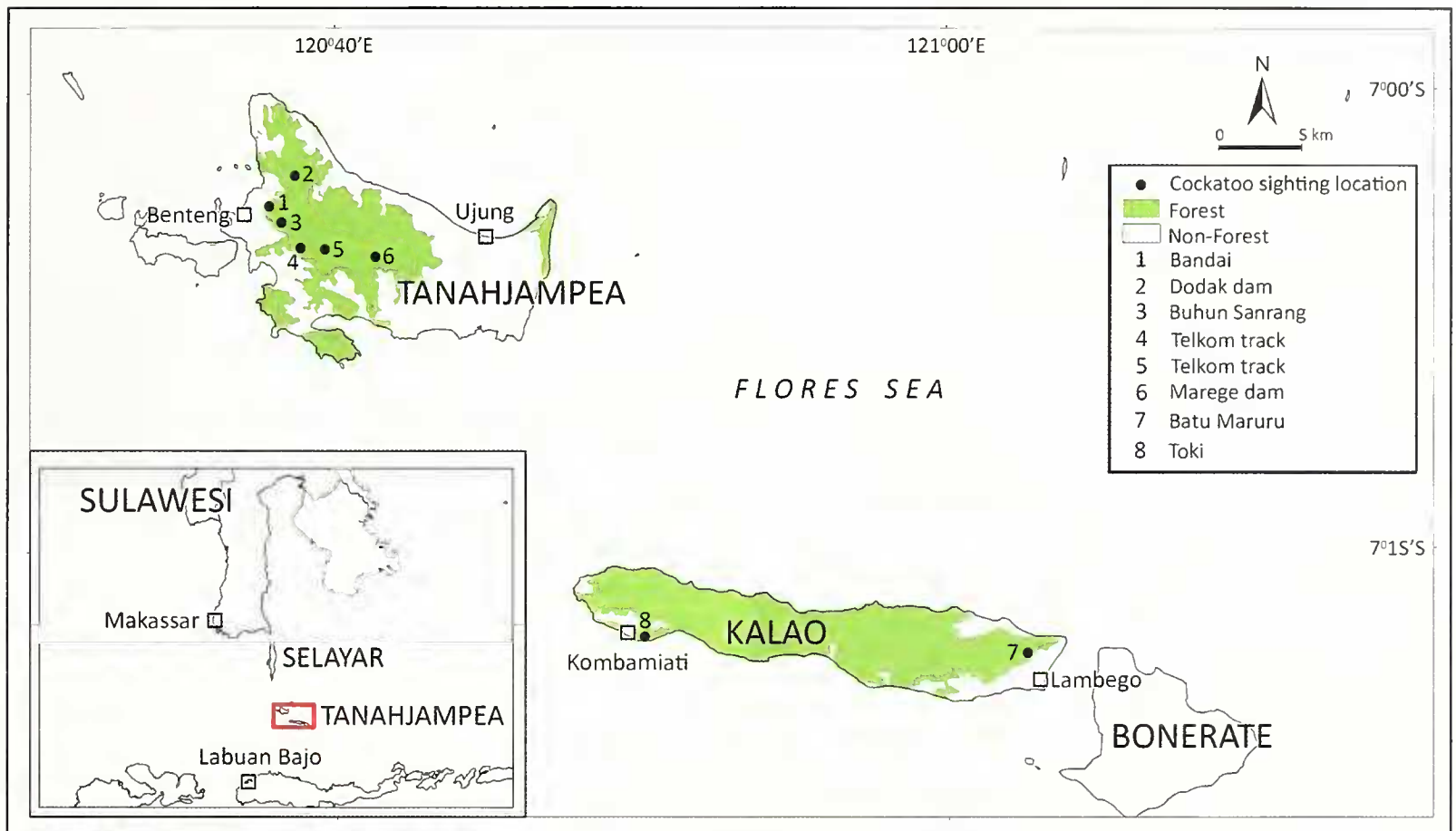
Encounters

We encountered Yellow-crested Cockatoos on eight occasions, six on Tanahjampea (14 birds) and twice on Kalao (three birds) (Table 2). The encounters occurred between 50–385 m on Tanahjampea and 0–120 m on Kalao. With the exception of one encounter on Kalao, where two cockatoos flew over a new garden, all encounters were in forest. Encounter locations are mapped in Figure 1.

The total length of observation trail on both islands was 17.84 km: 14.18 km on Tanahjampea and 3.66 km on Kalao.

Table 2. Location of Yellow-crested Cockatoos *Cacatua sulphurea djampeana* on Tanahjampea and Kalao, September 2015

Date	Island	Location	Altitude (m)	Habitat	Nos.	Seen/heard	Activities	Observer	
8	Tanahjampea	Bandai	7.062°S 120.631°E	50	secondary forest	2	seen	grooming; roosting	HB, TA
8	Tanahjampea	Dodak dam	7.045°S 120.645°E	50	secondary forest	1	heard	flying?	HB, TA
10	Tanahjampea	Buhun Sanrang	7.070°S 120.638°E	150	secondary forest	4	seen	grooming; roosting	TA
10	Tanahjampea	Telkom track	7.084°S 120.648°E	215	secondary forest	3	seen	flying	HB
10	Tanahjampea	Telkom track	7.085°S 120.661°E	385	secondary forest	3	seen	flying; perching	HB
11	Tanahjampea	Marege dam	7.089°S 120.689°E	100	secondary forest	1	seen	flying from the ground; eating	HB, TA
12	Kalao	Batu Maruru	7.307°S 121.043°E	120	secondary forest	1	seen	perching; flying	HB, TA
13	Kalao	Toki	7.297°S 120.835°E	10	forest- garden	2	seen	flying	HB, TA

**Figure 1.** Yellow-crested Cockatoo *Cacatua sulphurea djampeana* sighting locations on Tanahjampea and Kalao, September 2015.

The overall encounter rate was 0.95 individual per km: 0.99 on Tanahjampea and 0.82 on Kalao.

From our observations and images we can confirm that the subspecies *djampeana* has a smaller bill than the birds from Sulawesi and that the ear-coverts are a strong, bright lemon-yellow as described by Collar & Marsden (2014).

Behaviour

A typical observation of the species's behaviour was made by HB at Bandai, Tanahjampea, on 8 September. A cockatoo pair arrived at a large *Dracontomelon* tree at 17h15. The birds perched on the highest branches, sometimes calling, grooming, auto- or allo-smoothing their wings or just sitting silently (Plate 1). It seems they also used the tree as a roosting site. Several times they left the tree but returned after a short time. Some parts of the tree had natural holes that might be used by cockatoos as a nest site (Plate 2). Local people said that sometimes three cockatoos could be seen in the tree.

TA observed similar behaviour at Buhun Sanrang on 10 September during the morning and afternoon at a partly dead *Dracontomelon* tree. Up to four cockatoos including a presumed pair visited the tree several times during the day, although occasionally they disappeared for longer periods, but always seemed to stay close by and returned to the tree within an hour. One member of the pair was clearly chasing its mate, grooming it, and occasionally examining a hole in one of the dry branches. During these activities a third bird was chased away by the presumed male of the pair.

From the behaviour of the birds and the condition of the trees, it seems that these two *Dracontomelon* were used for roosting and were potentially also nesting trees. Some holes in the trees (Plate 2) were possible nest-cavities, although we had no direct evidence that they were occupied during our visit.

Population

Residents of Tanahjampea said that the cockatoos could be easily seen on cornfields, especially at the end of the rainy season from March to June. They often came in a large group and up to 15 birds could 'raid' a field. However, almost everybody told us that the present cockatoo population was much reduced compared with 10–15 years ago, although they did not offer a definite reason for this.

Kalao residents also told us that cockatoos can be fairly easily seen during the corn season, when they visit gardens. They believed that at the time of our visit the cockatoos were deep in the forest, mostly in the north of the island. We saw one bird when we visited an area of forest in north-east Kalao. Our local guide told us that the cockatoo population was already significantly smaller than ten years ago, when groups up to 30 birds visited the cornfields. Today, generally only 3–5 birds visit the fields.

Habitat

On our two-day visit to Kalao we observed differences in the condition of the forests on the island. Forest in the eastern and central parts looked drier and had almost no large trees (diameter



H. BASHARI



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Plate 1. Yellow-crested Cockatoo *Cacatua sulphurea djampeana*, Tanahjampea, September 2015.



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Plate 2. *Dracontomelon* tree used by Yellow-crested Cckatoo, September 2015.

greater than 50 cm), while that in the west appeared greener and might be more suitable habitat for cockatoos or other parrots.

DISCUSSION

Population and habitat

We cannot determine the cockatoo's population on the two islands with certainty, but we judge that it cannot be larger than 250 birds combined. Although Kalao has a larger forested area (Figure 1) we formed the opinion that the Tanahjampea population is larger.

Tanahjampea, Kalao and Kalaotoa (Table 3) are the three islands of the Tanahjampea group with the greatest forest cover. We did not visit Kalaotoa and were unable to obtain information whether the species still survives there or not. However, if the condition of its forest resembles that on Tanahjampea or Kalao, Kalaotoa might still host a population of the cockatoo.

We rarely found trees with a diameter of more than 50 cm. In two encounter locations on Tanahjampea, Bandai and Buhun Sanrang, the cockatoos were seen on single *Dracontomelon* trees with a diameter of more than 50 cm. According to local people, this tree species is not felled when mature because generally it is hollow and unsatisfactory to use for timber. The situation is even more extreme on Kalao. Almost no tall trees of large diameter survive.

Threats

Whitten *et al.* (1987) stated that the forests of the small islands south of Sulawesi had all been converted to agriculture by 1915, with the exception of small areas of Tanahjampea and Kalaotoa (Kalao was not mentioned). Although this assessment proves or appears to have been overly pessimistic, the main threat is undoubtedly the complete clearance of forest for agriculture. These cleared areas (*kebun*) are often found up to 300 m. People make the new kebun by felling all trees and natural vegetation. This action not only significantly reduces the forest area but also prevents the growth of potential nest trees for the cockatoos and increases the danger of erosion in hilly areas (Plate 3). The absence of large trees on Tanahjampea and Kalao must affect the species's

Table 3. Land cover analysis for main islands*.

Island	Area (ha)	Forest (ha)	Forest (%)	Non-forest (ha)	Non-forest (%)
Kayuadi	1,882	–	–	1,882	100
Tanahjampea	17,166	7,486	44	9,680	56
Bonerate	12,730	–	–	12,730	100
Kalao	11,161	9,393	84	1,768	16
Karompa-lompa	162	–	–	162	100
Karompa	1,184	18	2	1,166	98
Kalaotoa	7,801	1,150	15	6,651	85
Madu	891	51	6	840	94
Total	52,977	18,098	34	34,879	66

* Analysis by Indah Ristiana based on Land Cover Map (2011) from General Directorate of Forestry Mapping and Environment Management, Ministry of Environment and Forestry.



Plate 3. Clearance of forest for a new *kebun* on Tanahjampea.

breeding success. Nest-tree characteristics of the Sumba Yellow-crested Cockatoo *C. s. citrinocristata* are: total height 30–40 m, bole height 15–25 m and 59–156 cm diameter at breast height (Djawarai *et al.* 2014). Unless further deforestation is stopped and large diameter trees (particularly *Dracontomelon*) preserved, there will be no future nesting sites for the cockatoos, and the population will rapidly die out.

Hunting and trapping are also a threat to the cockatoos, particularly on Tanahjampea. Several times we met residents out hunting with air-rifles, especially targeting birds. They told us they had no specific target and sometimes hunted for food, but more often simply for pleasure. They occasionally shot cockatoos, which of course is a serious threat to the species. There are no reports on the poaching of cockatoos on Tanahjampea, but residents indicated to us that this had occurred in the previous 10 years.

Conservation

Fortunately there is currently no trapping of cockatoos for the pet trade on Tanahjampea and Kalao. Most people on Tanahjampea are farmers. Land is used intensively for cashew and coconut plantations and rice. However, much forest is cleared for non-intensive *kebun* that produce corn and tubers. Some farmers already use an irrigation system but others remain heavily dependent on rainfall. As a continuous water supply is vital to rice cultivation as well as for human needs, the retention and improvement of the remaining forest can be encouraged as a social imperative as well as a conservation requirement for the Yellow-crested Cockatoo. A critical part of any conservation strategy must be an awareness campaign to convince resident farmers and hunters to stop killing and persecuting the cockatoos.

For future conservation of the cockatoo, the main challenge is to preserve the remaining forest area including known and potential nest trees, as well as efforts to ensure successful breeding. The use of nest-boxes, particularly on Kalao, should be considered as a short-term solution. Sumba Cockatoos have attempted to use nest-boxes in Manupeu Tanadaru forest (Walker *et al.* 2001) and in Laiwanggi Wanggameti National Park (S. Ongo verbally).

A more accurate estimation of the population of the cockatoo and other parrots is needed as a basis for conservation efforts in the future.

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